

Recommended Practice Annular Pressure Management in Offshore Wells

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WJP Enterprises

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Scope

- Guideline for managing annular casing pressure in offshore wells
- Modeled after GOM OCS wells, but applicable to similar type wells worldwide
- Performance and risk based methodology to answer the question "Is the pressure on the casing an unacceptable risk?"

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Work Methodology

- Sponsored by API and OOC
- MMS fully involved
- Two Contractors
 - DNV: Risk Assessment
 - WJP Enterprises: Technical Writing

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Work Methodology

- 5 Workgroups headed by Champions
 - Fixed Platform Wells (Scot Childress)
 - Subsea Wells (Chris Nelson)
 - Hybrid Wells (David Harris)
 - Documentation (Steve Ledet)
 - Risk Assessment (Charlie Duhon)

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Work Methodology

- 13 Operating Companies Actively Involved
 - Represents 77% of oil production & 57% of gas production on the GOM OCS
- Manufactures
- Engineering Consultants
- Regulatory Consultants
- Over 60 individuals have participated

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Work Methodology

- Hold a workshop when document 50-75% complete to gain broad Industry input
- Update the RP following the workshop
- Ballot the RP through API
- MMS consider adopting the RP in whole or in part into the regulations

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Schedule

- Nov, 2001 NPRM Published
- March, 2002 Comment Period Closed
- Feb, 2003 Award SS WH Penetration Study
- July, 2003 MMS Delay Final Rulemaking
- Sept, 2003 Award RP Technical Writing
- Jan, 2004 Kick off Well Team Champions
- Feb, 2004 Award Risk Study
- Aug, 2004 Workshop on Draft RP
- 1st Qtr, 2005 Ballot RP

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What's Covered

- Type of Wells
 - Fixed Platform
 - Surface wellhead and tree
 - Mudline Suspension Wells
 - Subsea
 - Subsea wellhead and tree
 - Mudline Conversion Wells
 - Hybrid
 - Subsea wellhead
 - Surface tree

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What's Covered

- Annular Pressure in Offshore Wells
 - Thermal Pressure
 - Sustained Casing Pressure
 - Operator Applied Pressure

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What's Covered

- Sources of Pressure
- Leak Paths
- Monitoring
- Diagnostic Test Methods
- Analysis of Bleed Down/Build Up Tests
- SCP Decision Tree
- Risk Assessment Methodology
- Documentation

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What's Not Covered

- Few highly prescriptive details
 - Performance and/or risk based
- Reporting requirements to a Gov't Agency
- Prevention measures
- Remediation measures

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Walk Through the RP

- Section 1: General
 - Scope
 - Definitions of Terms

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Walk Through the RP

- Section 2: Sources of Pressure
 - Thermal
 - Sustained
 - "A" Annulus
 - Outer Annuli

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Walk Through the RP

- Section 3: Risk Assessment Principles
 - Pertain specifically to annular pressure

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Walk Through the RP

- Section 4: Pressure Containment and Leak Path Considerations for Well Design
 - 2 barrier principle
 - Overview of design principles as it applies to annular pressure
 - MAWOP-Maximum Allowable Wellhead Operating Pressure

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Walk Through the RP

- Sections 5, 6, 7 & 8: For each well type
 - System and key component overview
 - Method & frequency of monitoring
 - Pressure Bleed Down/Build Up Tests
 - Thermal
 - SCP
 - Operator Applied
 - Further Diagnostic Actions

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Walk Through the RP

■ Section 9: Documentation

- Annular Pressure Policy
- Monitoring
- Bleed Down/Build Up Tests
- MAWOP
- SCP Decision Tree (TBD)
- Risk Assessment (TBD)

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Walk Through the RP

■ Section 10: SCP Decision Tree

- Series of flow charts to guide you through the process

■ Section 11: Risk Assessment

- Consequence Classes
- Fault tree analysis

■ Section 12: SCP Risk Assessment Tool

- Excel spreadsheet

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Walk Through the RP

- Appendix A
 - Wellbore diagrams for each well type
- Appendix B (TBD)
 - Example Documentation
- Appendix C (TBD)
 - Example MAWOP Calculation
- Appendix D (TBD)
 - Example Design Tree
- Appendix E (TBD)
 - Example Risk Assessment

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Workshop Goals

- Overview of the draft RP
- Small group discussion on RP details
- Solicit input on the draft RP from a broad group within Industry
 - Improve the management process
 - Improve the document

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Input After the Workshop

- Send all comments to Andy Radford

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